

 <b>Independent Verification &amp; Validation Facility</b>	<b>Management and Performance of Research</b>	<b>IVV 09-6 Revision: D Effective Date: May 2002</b>
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<b>APPROVAL SIGNATURES</b>		<b>DATE</b>
Gregory Blaney (original signature on file)	QMS Management Representative	04/25/02

<b>REVISION HISTORY</b>			
Rev No.	Description of Change	Author	Effective Date
Initial	Initial Release	Rhonda Fitz IT/300	2/24/99
Rev A	Clarification of NF 1676 form for NASA publication	S.Yassini/IT/232	9/9/99
B	Format and Number changes; Delete Reference to Ames Research Center	Griggs	12/06/00
C	Extensive rewrite to reflect procedural changes resulting from the transfer to GSFC	Kenneth McGill	07/02/01
D	Updated paragraphs 2, 3.8, 3.11, 5.2, and 6.3	Wesley Deadrick	05/15/02

<b>REFERENCE DOCUMENTS</b>	
Document Number	Document Title
IVV 00	IV&V Facility Quality Manual
IVV 09-3	OSMA Software Assurance Research Program (SARP)
IVV 09-4	Project Management
IVV 09-6-1	Work Instruction for the Publication and/or Presentation of Research Results
IVV 16	Control of Quality Records
NASA Policy Directive 2220.5E	Management of NASA Scientific and Technical Information

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## 1. Purpose

The purpose of this procedure is to establish a consistent and documented method for the management and performance of all research by or under contract with the NASA Independent Verification and Validation (IV&V) Facility, Goddard Space Flight Center (GSFC). The information provided here is intended to be compliant with NASA Policy Directive 2220.5E, Management of NASA Scientific and Technical Information.

## 2. Scope

The general requirements within this procedure address management and performance of systems and software engineering research as performed by or through the IV&V Facility. This procedure is applicable to research performed at the IV&V Facility as well as research performed under contract to the IV&V Facility. This includes, but is not limited to, the IV&V Facility research performed under the NASA Office of Safety and Mission Assurance (OSMA) Software Assurance Research Program (SARP). (See IVV 09-3.) This document does not apply to the management of the OSMA SARP, or OSMA SARP research carried out by other NASA Centers. Note that the objective of OSMA SARP is beyond the scope of this document.

The scope of this procedure encompasses all research activities from the identification of research opportunities to the delivery of research products.

## 3. Definitions and Acronyms

### 3.1 Center Initiative Management (CIM) Tool

The CIM Tool is a research management system developed for the OSMA SARP. The tool is flexible enough to support other non-SARP research. The Government Point of Contact (POC) and the Principal Investigator (PI) use the CIM Tool to deliver all proposals and research products. The CIM Tool is the accepted method of receiving, approving, and tracking all proposals and deliverables.

### 3.2 Customer

Anyone providing a research requirement or funding for research.

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### **3.3 Customer Requirements**

Requirements received from any customer for products or services. Customer requirements for research products may be contained in, but are not limited to, Cooperative Agreement Notices, Announcements of Opportunity, NASA Research Announcements (NRAs), Task Agreements, program/project plans, and specifications.

### **3.4 Government Point of Contact (POC)**

An IV&V Facility civil servant employee having the authority and responsibility to prepare, implement, and direct a specific research effort. Each research project will have a government POC responsible for the effort. In many cases the government POC will also be the principal investigator (PI). However, when the PI is a non-government employee, a separate government POC must be designated to provide overall direction and financial management.

### **3.5 IV&V Facility Research Lead**

The person responsible for managing the day-to-day performance, schedule, and funding of all Facility research.

### **3.6 Principal Investigator (PI)**

The PI is the lead researcher who actually conducts the research. There will be a PI designated for each research effort. If the PI is a civil servant, the PI may also be the government POC. However, if the PI is from an industry or an academic institution, a separate government POC must be appointed.

### **3.7 Researcher**

Person responsible for conducting the research in accordance with a documented Research Plan, reporting status periodically to the PI and documenting and/or presenting research results.

### **3.8 Research Plan**

Documents developed to plan research activities and to describe the scientific and/or technical objectives, deliverables, and resources needed.

### **3.9 Research Product**

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Products such as scientific and technical publications, data, research results, and associated system, hardware, and/or software prototypes.

### **3.10 Resource Management Office (RMO) Analyst**

A NASA civil servant responsible for the management and reporting of financial resources at the Facility.

### **3.11 Acronyms**

CIM	Center Initiative Management
GSFC	Goddard Space Flight Center
CSIP	Center Software Initiative Proposals
IAW	In Accordance With
IV&V	Independent Verification and Validation
NASA	National Aeronautics and Space Administration
NRA	NASA Research Announcement
OSMA	Office of Safety and Mission Assurance
PI	Principal Investigator
POC	Point of Contact
RMO	Resource Management Office
SARP	Software Assurance Research Program
SLP	System Level Procedures

## **4. Flow Chart**

A flow chart is not necessary for this document.

## **5. Responsibilities**

### **5.1 Research Lead Shall:**

- Ensure research is relevant to and consistent with the vision and mission of the IV&V Facility strategic vision and mission,

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- In the case of OSMA SARP funded research, ensure that IV&V Facility research is consistent with existing SARP objectives,
- Set specific goals and objectives for IV&V Facility research,
- Approve or disapprove the research proposals,
- Maintain awareness of research progress and provide direction through the conduct of periodic reviews of research activities,
- Oversee the execution of all Facility research, and
- Identify means and resources for the conduct of research.

## **5.2 Government POC Shall:**

- Manage the programmatic and financial aspects of a given research effort,
- Determine which research products should be cleared for public release, and
- Ensure these products are cleared per IVV WI 09-6-1.

## **5.3 PI Shall:**

- Prepare a separate research plan if no plan has been submitted as part of the original proposal.
- Conduct research using acceptable scientific methodologies and practices in the related field and in accordance with the research plan.

# **6. Procedure**

## **6.1 Overall Data Management**

The OSMA Center Initiative Management (CIM) tool is a web-based application used to facilitate research management and will be used for tracking:

- Research plans/proposals and their revisions,
- Research deliverables,

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- Information from bimonthly reviews, and
- Information for quarterly reviews.

For additional information regarding this process check the OSMA Software Assurance Research Program (SARP) Facility SLP IVV 9-3.

## **6.2 Identify Research Opportunities**

The Research Lead, potential PIs and/or the external customer identify research needs and opportunities.

## **6.3 Develop Research Plan**

A potential PI will lead the research initiative, beginning with the development of the research plan. The PI writes the research plan or proposal in accordance with customer requirements and applicable procedures. Research Plans may be, but are not limited to, Center Software Initiative Proposals (CSIPs) submitted under the OSMA SARP, proposals in response to NASA Research Announcements (NRAs), or unsolicited proposals. Each of these proposals have different formats. Formats and required elements are listed on the Internet page containing the call for proposal. When research is initiated under an existing IV&V contract and not via a new proposal, the researcher shall prepare a separate research plan. The plan can be submitted in contractor format but should contain the same elements as a CSIP. See <http://www.ivv.nasa.gov/business/research/SARP/index.shtml>. At a minimum, the following areas should be addressed:

- Research objectives
- Research approach/methodology
- Schedule/milestones,
- Resources,
- Budget,
- Product deliverables, and
- Process monitoring methods/procedures

## **6.4 Government Management Infrastructure**

If the PI is not a government employee, then a separate government POC should be appointed by the Research Lead to manage the government finances and

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administer the project. In those cases where the PI is a government employee, the PI will assume these duties.

## **6.5 Review the Research Plan**

The Research Lead, Government POC and others as appropriate shall review the research plan/proposal, recommend improvement and determine if it should go forward to the customer.

In those cases when the IV&V Facility is funding the research (versus NRAs, OSMA SARP research, or other external funding), the Research Lead has approval authority.

## **6.6 Receive and Commit Resources**

The Government POC shall monitor the receipt of external funding and work with the IV&V Facility RMO to obligate the funds.

## **6.7 Conduct Research**

### **The PI Shall:**

- Conduct research using acceptable scientific methodologies and practices in the relevant field and in accordance with the Research Plan, and
- Keep appropriate scientific evidence of research activities.

## **6.8 Government POC**

The Government POC shall be responsible for the technical direction of the research project. This shall entail but is not limited to the following responsibilities:

- Ensure that all efforts defined in the Research Plan are performed in accordance with the approach and in compliance with the standards and procedures as stipulated,
- Support quarterly reviews by providing a project status and financial status, and
- Ensure that all deliverables defined in the Research Plan have been received, are in suitable format, and contain valid technical content.

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## 6.9 Review Results

The Research Lead shall review and approve the research results prior to delivery to the customer.

## 6.10 Deliver Research

The IV&V Facility shall deliver research products to the customer per the customer's instructions.

## 6.11 Publish Results

If warranted by the content, the Government POC shall have the deliverable cleared for public release IAW Facility SLP IVV 09-6-1. Research products shall be delivered to the CIM Tool for cataloging, storing, and retrieval.

## 7. Metrics

The Center Initiative Management (CIM) Tool is used to track the progress of CIs and UIs. The tool maintains a running comparison of what deliverables have been received, reviewed, and accepted versus those which should have been submitted. PIs are required to report funds obligated and funds costed each quarter. These data are also available through the CIM Tool.

## 8. Records

The following Quality Records shall be generated and managed in accordance with IVV 16, Control of Quality Records, when applicable in accordance with the Work Instruction for the Publication and/or Presentation of Research Results, IVV 09-6.1.

Document Name and Identification Number	User Responsible for Record Retention	Retention Requirement	Location
Research Plan	Government POC	Destroy when superseded or one year after project completion	Project File or Electronic File
NASA Scientific and Technical Document Availability Authorization (the signed NF 1676)	Government POC	Permanent	Project File or Electronic File

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Research Deliverables	Government POC	Permanent	Project File or CIM Tool
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